Commonwealth of Kentucky
Division for Air Quality
EXECUTIVE SUMMARY

FINAL
TITLE V PERMIT V-02-043 REVISION 3
Louisville Gas and Electric Company
P.O. Box 32010, Louisville, Kentucky, 40232
COMBUSTION SECTION, REVIEWER
March 3, 2008
SOURCE I.D. #: 021-223-00002
SOURCE A.I. #: 4054
ACTIVITY #: APE 20070001

CURRENT PERMITTING ACTION: Significant RevisionV-02-043 R3

Background

On January 4, 2006, Permit V-02-043 was revised to provide for construction and operation of a new 750 MW net nominal supercritical pulverized coal (SPC) boiler and associated support equipment ("Revision 2"). On February 13, 2007, the Division received an application for a significant revision to amend the permit for permitting design revisions to the SPC boiler project. This revision ("Revision 3") is being reviewed as a significant permit revision under 401 KAR 52:020 Section 16. A summary of Revision 3 changes to the project's potential-to-emit (PTE), regulatory applicability, and the model-predicted maximum impacts as a result of this revision are presented in the application that was submitted to Division on February 13, 2007.

PROJECT SUMMARY

As part of Revision 3, Emission Unit 31 will also be equipped with a dry electrostatic precipitator (DESP), powdered activated carbon (PAC) injection and hydrated lime injection. The DESP will ensure that saleable fly ash is captured prior to potential contamination due to PAC injection for mercury control. The hydrated lime injection will assist in proper conditioning of the Pulse Jet Fabric Filter (PJFF) bags by potentially reducing SO_3 emissions for some fuel combinations. However, it has not been proposed as an alternative SO_3 emission reduction technology.

The proposed modifications do not affect the new boiler, Emission Unit 31, BACT determinations, nor cause the increase in any NSR regulated air pollutant. An increase in the size and hours of operation of the auxiliary boiler (Emission Unit 32) will potentially result in an insignificant increase in carbon monoxide emissions. The potential emissions of sulfur dioxide and sulfuric acid mist decreased due to the switch to ultra low sulfur fuel oil in the auxiliary boiler. Ultra low sulfur (ULS) is defined as a fuel that contains less than 15 ppm of total sulfur. The potential emissions from the emergency generator (Emission Unit 33) also decreased as a result of the proposed change to ULS fuel along with the proposed reduction in the number of hours of operation on an annual basis. Additionally, with this revision the originally proposed emergency diesel fire water pump (insignificant activity) and the three existing auxiliary boilers (Emission Units 7, 8 and 9) are not required. The elimination of emissions from these sources will further decrease the overall Project's PTE.

Material handling emissions have the potential to minimally increase as a result of this revision due to several changes. Specifically, these changes consist of (1) the addition of material handling silos (waste ash, hydrated lime and PAC), (2) movement of the proposed conveyers transfer points with their currently established BACT controls, (3) new conveyor transfer points with the BACT controls, and (4) new haul road emissions due to additional haul road length to extend the previous route to the northwest corner of the ash pond and the change in methodology used to calculate these emissions. Additionally, there was a significant decrease in particulate emissions associated with ash transfer design change from truck transport to a wet transfer of the fly ash to the pond.

With the change to ULS fuel, the heating value of the oil fired for the auxiliary boiler (Emission Unit 32), emergency generator (Emission Unit 33), and for startup operations of the Unit 2 boiler (Emission Unit 31), along with the increase in hours of operation for the auxiliary boiler, the amount of fuel oil utilized at the facility increased. The increase in oil consumption will cause an increase to the turnover rates of the fuel oil storage tanks, thus the VOC emissions from the fuel oil storage tank will insignificantly increase. Fuel oil storage tanks are an insignificant activity and are listed as such in the permit.

The emission calculations for the Linear Mechanical Draft Cooling Tower (LMDCT) (Emission Unit 41), were updated based on a more conservative assumption that 100 percent of the salt is PM_{10}. As a result, the calculated total PM emissions from the LMDCT increased. However, potential PM emissions from the natural draft cooling tower (Emission Unit 20) significantly decreased as a result of the proposed modifications to reduce existing drift rate from 0.008% to 0.0005%. This change to the natural draft cooling tower's drift eliminators will occur prior to Emission Unit 31 commencing operation.

The applicant used the same methodology presented in the 2004 Application to determine the emissions change from the Project revisions. These emissions were incorporated into the Project's potential-to-emit calculations used to determine the PSD/NSR major modification determination. The methodology to calculate these emissions can be found in Section 2 and Appendices C and D of the February 2007 Application. Table 3.1 depicts the PTE emissions that were presented in the 2004 Application document while Table 3.4 illustrates the PTE resulting from the proposed Project's optimizations. The net emissions resulting from the proposed revisions based on the refined design are presented in Table 3.5. As presented in Table 3.5, the emissions of the proposed changes are below their applicable significant emission increase threshold for a major modification under PSD. Likewise, as shown in Table 3.4, there are no changes to the project's applicability under the original PSD review process from what was determined for the 2004 Application and established as the basis for the subsequently issued permit in January 2006.

U.S. EPA REVIEW:

The U.S. EPA was notified of the issuance of the proposed permit on January 15, 2008 via e-mail. The comment period expired 45 days from the date of e-mail. No comments were received during this period. The permit is now being issued final.